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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/556,086	04/21/2000	Maxwell J. Wells	1702-1-3	7449

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EXAMINER	
FERRIS III, FRED O	

ART UNIT	PAPER NUMBER
2128	

DATE MAILED: 07/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/556,086	WELLS ET AL.	
	Examiner	Art Unit	
	Fred Ferris	2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 April 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20,22-24,26,27,29-31 and 33-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20,22-24,26,27,29-31 and 33-43* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 April 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-20, 22-24, 26-27, 29-31, and 33-43 are currently pending in this application have been presented for reconsideration based on applicant's arguments filed 21 April 2006. Claims 1-20, 22-24, 26-27, 29-31 and 33-43 remain rejected.

Response to Arguments

2. Applicant's arguments filed 21 April 2006 with respect to claims 1-20, 22-24, 26-27, 29-31, and 33-43 have been considered but are not persuasive.

Regarding applicant's response to 103(a) rejections: The main thrust of applicant's arguments center around arguing that the prior art does not teach a "conceptual model of human perception of music". In response the examiner submits that applicant's "computational model of human perception" as presently claimed, simply consists of three method steps. For example, referring to independent claim 1 they are:

1) extracting two numeric parameters (min.) from five musical recordings (min.)

2) combining numeric parameters with weighting forming a single number descriptor

3) adjusting the weighting to find set matching perceptions reported by human listeners.

The examiner maintains that these broad limitations are rendered obvious by the prior art for the following reasons.

First, Martin clearly sets forth that the research disclosed in the reference is directed toward the construction of a "model" of "human music perception" (page 7, para:1) including using the response of human listeners to identify musical parameters

and "classify" the music (page 7, para:2-3, i.e. report human perceptions), and introduces the concept of modeling perception by building "statistical classifiers" for evaluating musical "properties" and making "musical judgments" (page 7, para:4).

As to the first method step, the claimed extracted two "numeric parameters" are simply any two musical parameters including rhythm, tempo, loudness, and harmonic content (Specification 4.2.4). These elements are taught by both Martin and Blum as noted below under 103 rejections.

Considering the second method step, the claimed combining numeric parameters with weighting forming a single number descriptor simply amounts to statistical weighting as previously asserted by the examiner in the 103 rejection below. In statistics "weighting" is simply a factor assigned to a number in a computation, as in determining an average, to make the number's effect on the computation reflect its importance. Blum teaches the use of such weighting techniques in order to emphasize perceptually important sections of musical sound (CL6-L40-43). Hence a skilled artisan would have known to "weight" the extracted numeric parameters into a single "weighted" representation of the numerical parameter (i.e. a single number descriptor) in order to emphasize its computational importance.

As to the final method step of adjusting the weighting to find a set matching perceptions reported by human listeners, Martin sets forth using the response of human listeners to identify musical parameters and the concept of modeling perception by building "statistical classifiers" as noted above. Statistical classification is a well-known statistical procedure in which individual items are placed into groups based on

quantitative information. (See: Wikipedia encyclopedia, for example) In this case, the groups are simply the set of weightings matching perceptions reported by human listeners. That is, it would appear that Martin, at least conceptually, sets forth the idea of using statistical classification with the perception of music reported by human listeners in constructing a model of human perception of music, as does the claimed invention.

It should also be noted that statistical elements including weighting of extracted sound parameters, mean and variance are disclosed in prior art Pheiffer (pp. 27 para:6-7, of record). This serves to further buttress the examiner's position that such techniques were obvious and well-known to a skilled artisan at the time of the invention.

The examiner therefor maintains that any skilled artisan having knowledge of well-known statistical classification techniques, and having access to the teachings of Martin and Blum, would have been able to realized the claimed elements of the "conceptual model of human perception of music" recited in independent claims 1 and 10 of the present invention. In as much as independent claims 3, 5, and 6 relate to a data record, computer medium, and database searching based on the same elements, they would similarly be rendered obvious by the prior art using the same reasoning. As to independent claims 18 and 26, the recited "difference between music recordings" where "extracted parameters" for "pairs of recordings" would further be rendered obvious using this reasoning since Blum, for example, also teaches storing and retrieving sounds from a database based on similarity and the difference between sound samples (CL17-L20-55).

MPEP 2106 recites the following supporting rational for this interpretation:

> "While it is appropriate to use the specification to determine what applicant intends a term to mean, a positive limitation from the specification cannot be read into a claim that does not impose that limitation. A broad interpretation of a claim by Office personnel will reduce the possibility that the claim, when issued, will be interpreted more broadly than is justified or intended. An applicant can always amend a claim during prosecution to better reflect the intended scope of the claim."

Regarding arguments that the prior art provides not motivation to combine Martin and Blum. MPEP 2144 Sources of Rationale Supporting a Rejection Under 35 U.S.C. 103 recites the following:

> "The rationale to modify or combine the prior art does not have to be expressly stated in the prior art; the rationale may be expressly or impliedly contained in the prior art or it may be reasoned from knowledge generally available to one of ordinary skill in the art, established scientific principles, or legal precedent established by prior case law. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). See also In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000) (setting forth test for implicit teachings); In re Eli Lilly & Co., 902 F.2d 943, 14 USPQ2d 1741 (Fed. Cir. 1990) (discussion of reliance on legal precedent); In re Nilssen, 851 F.2d 1401, 1403, 7 USPQ2d 1500, 1502 (Fed. Cir. 1988) (references do not have to explicitly suggest combining teachings)"

The examiner has simply asserted that a skilled artisan tasked with solving the problem of creating a model of human perception of music (i.e. as taught by Martin), and including database records of music (i.e. as taught by Blum), and further having access to the teachings of Martin and Blum, would have knowingly modified the teachings of Martin, with the teachings of Blum in order to realize the claimed subject matter based on knowledge available to a skilled artisan and the nature of the problem to be solved. It should be noted that at least at Page 7, paragraph 3, of Martin, additional motivation to combine is found in the recitation that modeling human perception of music "would be highly useful as a basis for constructing musical multimedia systems". Therefor, a skilled artisan working in this obviously competitive multimedia environment would have made an effort to become aware of what capabilities had already been developed in the market place, and hence would have

been aware of, and known to seek out the relative teachings of the problem to be solved. Namely, the teachings of Martin and Blum.

MPEP 2143.01 Suggestion or Motivation To Modify the References further recites the following supporting rational:

> Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. **"The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art."** In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000).

The examiner therefore appears to have established an implicit showing that in view of the combined teachings of the prior art, the relative knowledge of one skilled in the art, and in particular, the nature of the problem to be solved, there exists an obvious motivation to combine the references as noted above.

Accordingly, for the reasons set forth above, and below under 103(a) rejections, the examiner maintains the rejection of claims 1-20, 22-24, 26-27, 29-31 and 33-43. However, upon review of applicant's specification, the examiner notes that Sections 4.2.5 (pp. 14, lines 10-15, descriptors) and 4.4.2 (likeness model) appear to disclose subject matter that has not been specifically claimed, but would possibly assist in distinguishing the invention over the prior art of record.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-20, 22-24, 26-27, 29-31 and 33-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Music Content Analysis through Models of Audition", Martin et al, ACM Multimedia Workshop '98, ACM 1998 in view of U.S. Patent 5,918,223 issued to Blum et al. (Of Record)

Regarding independent claims 1, 3, 5, and 6: Martin teaches method for building a computational model of human perception of music (page 1, para:3-5, page 7, para:1) by extracting representations (page 6, para:1-4, Abstract) of musical recording parameters (i.e. parameters for at least rhythm and pitch). Most importantly Martin suggests that a computational model of human perception of music should be based on the perceptions reported by a human listener (page 5, para:4, page 7, para:1-3) and that computational model descriptors of recordings should closely match perceptions as heard (reported) by a human listener (page 7, para:1, 2). Martin specifically sets forth that only a human listener can "identify genre" and realize "what other pieces or kinds of

music it bears similarity to". (i.e. a music classification system and model must account for the fact that a sample piece of music can belong to one of several "classes" (genre) of music)

Martin does not explicitly disclose combining parameters to compute a descriptor or the use of parameter weighting.

Blum et al discloses analysis and comparison of audio data files based on content where the analysis produces a numeric value (feature vector) that can classify and rank the similarity between individual audio files (Abstract). Blum further discloses the extraction of scalar descriptors that numerically describe recorded music, creating/searching a database of recorded audio data (Abstract, CL6-L12, CL6-L54, Figs. 1-5), and extracting multiple parameters from (n) number of recorded (electronic representation) audio files (CL7-L14-47, CL15-L29, Figs. 2, 14) Blum also teaches statistical weighting of audio waveform sample (recorded) parameters to compute a description (numerical) of the sample. (Abstract, CL10-L67 to CL11-L45, Figs. 6-7) In statistics, "weighting" is a technique used to assure representation of certain groups in the sample. Data for underrepresented cases are weighted to compensate for their small numbers, making the sample a better representation of the underlying population. (Source: "Statistical Methods", Freund, Academic Press, 1993) Hence "weighting" would have knowingly been incorporated by a skilled artisan, in order to provide a better representation of the descriptor parameters, and to "balance" the descriptors to match the human perception reported by listeners. Weighting techniques are also implemented by Blum (CL14-L41-65, Fig. 13) as noted above. Here amplitudes of sound files are

weighted to cause statistical values to depend more on louder parts. The examiner also maintains that "combining" and "weighting" the descriptors from multiple samples of music would be necessary in order to determine the similarity of a particular piece of music with other genres as realized by Martin.

It would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to modify the teachings of Martin relating to a computational model of human perception of music based on perceptions of a human listener, with the teachings of Blum relating to extraction of scalar descriptors that numerically describe recorded music, creating/searching a database of recorded audio data, to realize the elements of the claimed invention. An obvious motivation exists since, as referenced in the prior art, only a human listener can "identify genre" and realize "what other pieces or kinds of music it bears similarity to". (See: Martin, page 7, para:1, 2). Accordingly, a skilled artisan tasked with realizing a system, method, and database for music searching based on human perception, and having access to the teachings of Martin and Blum, would have knowingly modified the teachings of Martin with the teachings of Blum (or visa versa) to realize the claimed elements of the present invention.

Per dependent claims 2, 14-17: Blum would obviously include a computer readable medium containing the computer program for performing the disclosed techniques relating to music perception and a database of music recordings (Fig. 1).

Per claims 7, 10-13, 18-20, and 26: As cited above, Blum teaches a method and system for creating and searching a database of data records which are associated with

music recordings. (Fig. 1) The method and system are based on a model formed from the perception of the music inclusive of extracting numeric parameters from an electronic representation of musical recordings. Blum also considers the likeness (i.e. similarities) between the extracted representation of the various musical recordings, extracting numeric parameters (i.e. descriptors) from recordings by use of weighting parameters (CL17-L7 to CL18-L43), and computing (calculate) the correlation between recorded sections (i.e. the stored numerical descriptors). Blum also teaches identifying data records associated with a music recording in a computer readable database (CL21-L53 to CL26-L10) based on numerical parameters (descriptors) describing the music. As noted above the combination of Blum and Martin renders obvious adjusting the weighting based on human perception and using a human's perception of a sound source in modeling the effect on the descriptors (parameters describing the music and recording database) of the music as would be perceived by human subjects.

Per dependent claims 4, 8, 9, 22-24, 30-31, 33: Blum would obviously include a computer readable medium containing the computer program for performing the disclosed techniques relating to music perception and a database of music recordings (Fig. 1).

Per dependent claims 27, 29, 34-43: This group of claims merely require that groups of at least two numeric parameters from well-known musical attributes relating to dynamic range, loudness, harmony, rhythm, attack, tempo, note duration, key, etc. be selected. (See: Blum Figs. 2-14)

Conclusion

4. ***THIS ACTION IS MADE FINAL.*** *Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).*

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, careful consideration should be given prior to applicant's response to this Office Action.

U.S. Patent 6,201,176 issued to Yourio teaches listener music databases.

U.S. Patent 5,616,876 issued to Cluts teaches music content databases.

"Toward the Digital Music Library: Tune Retrieval from Acoustic Input", R. McNab, DL 96', ACM 0-89791-830-4-96/03, ACM 1996 teaches listener music databases.

"Content-Based Classification, Search, and Retrieval of Audio", E: Wold, et al, IEEE 1070-986X/96, IEEE 1996 teaches listener music databases.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fred Ferris whose telephone number is 571-272-3778 and whose normal working hours are 8:30am to 5:00pm Monday to Friday. Any inquiry of a general nature relating to the status of this application should be directed to the group receptionist whose telephone number is 571-272-3700. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached at 571-272-3780. The Official Fax Number is: (703) 872-9306

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